CLAIMS

1. A method for producing a capacitor comprising, as one electrode, an electric conductor having formed on the surface thereof a dielectric layer and, as the other part electrode, a semiconductor layer formed on the electric conductor by energization using the electric conductor as the anode, wherein fine protrusions are formed on the dielectric layer before energization.

2. The method for producing a capacitor as claimed in claim 1, wherein the fine protrusion is in an island-like shape and/or in a feather-like shape.

3. The method for producing a capacitor as claimed in claim 1 or 2 above, wherein the fine protrusion has a width of 0.1 to 60 nm.

4. The method for producing a capacitor as claimed in any one of claims 1 to 3, wherein the majority of the fine protrusions are present on the outer surface of the electric conductor and on the inner pore surface within 10 μm from the outer surface.

5. The method for producing a capacitor as claimed in any one of claims 1 to 4, wherein the fine protrusion is at least one member selected from a metal oxide, a metal salt, a transition element-containing inorganic compound, a

transition element-containing organic compound and a polymer compound.

6. The method for producing a capacitor as claimed in claim 1, wherein the electric conductor is at least one member selected from a metal, an inorganic semiconductor, an organic semiconductor and carbon or a mixture thereof.

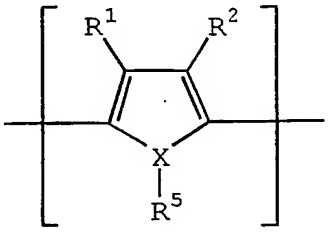
7. The method for producing a capacitor as claimed in claim 1 or 6, wherein the electric conductor is a laminated body having, as the surface layer, at least one member selected from a metal, an inorganic semiconductor, an organic semiconductor and carbon, or a mixture thereof.

8. The method for producing a capacitor as claimed in claim 1, wherein the dielectric layer mainly comprises at least one member selected from metal oxides such as Ta_2O_5, Al_2O_3, TiO_2 and Nb_2O_5.

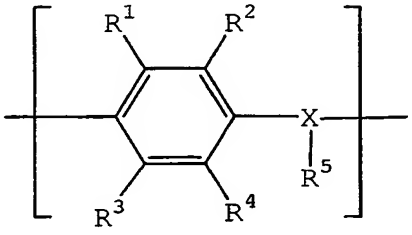
9. The method for producing a capacitor as claimed in claim 1, wherein the semiconductor layer is at least one member selected from an organic semiconductor layer and an inorganic semiconductor layer.

10. The method for producing a capacitor as claimed in claim 9, wherein the organic semiconductor is at least one member selected from an organic semiconductor comprising benzopyrroline tetramer and chloranil, an

organic semiconductor mainly comprising tetrathiotetracene, an organic semiconductor mainly comprising tetracyano-quinodimethane, and an organic semiconductor mainly comprising an electrically conducting polymer obtained by doping a dopant into a polymer containing a repeating unit represented by the following formula (1) or (2):



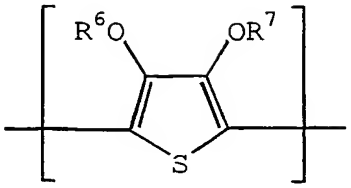
(1)



(2)

wherein R^1 to R^4 each independently represents a hydrogen atom, an alkyl group having from 1 to 6 carbon atoms or an alkoxy group having from 1 to 6 carbon atoms, X represents an oxygen atom, a sulfur atom or a nitrogen atom, R^5 is present only when X is a nitrogen atom, and represents a hydrogen atom or an alkyl group having from 1 to 6 carbon atoms, and each of the pairs of R^1 and R^2, and R^3 and R^4 may combine with each other to form a cyclic structure.

11. The method for producing a capacitor as claimed in claim 10, wherein the electrically conducting polymer containing a repeating unit represented by formula (1) is an electrically conducting polymer containing a structure unit represented by the following formula (3) as a repeating unit:



(3)

wherein R^6 and R^7 each independently represents a hydrogen atom, a linear or branched, saturated or unsaturated alkyl group having from 1 to 6 carbon atoms, or a substituent for forming at least one 5-, 6- or 7-membered saturated hydrocarbon cyclic structure containing two oxygen atoms when the alkyl groups are combined with each other at an arbitrary position, and the cyclic structure includes a structure having a vinylene bond which may be substituted, and a phenylene structure which may be substituted.

12. The method for producing a capacitor as claimed in claim 10, wherein the electrically conducting polymer is selected from polyaniline, polyoxyphenylene, polyphenylene sulfide, polythiophene, polyfuran, polypyrrole, polymethylpyrrole, and substitution derivatives and copolymers thereof.

13. The method for producing a capacitor as claimed in claim 11 or 12, wherein the electrically conducting polymer is poly(3,4-ethylenedioxythiophene).

14. The method for producing a capacitor as claimed in claim 9, wherein the inorganic semiconductor is at least one compound selected from molybdenum dioxide, tungsten

dioxide, lead dioxide and manganese dioxide.

15. The method for producing a capacitor as claimed in claim 9, wherein the electrical conductivity of the semiconductor is from 10^{-2} to 10^{3} S/cm.

16. A capacitor produced by the production method claimed in any one of claims 1 to 15.

17. The capacitor as claimed in claim 16, wherein the impregnation ratio of the semiconductor is 85% or more.

18. An electronic circuit using the capacitor claimed in claim 16 or 17.

19. An electronic device using the capacitor claimed in claim 16 or 17.